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Genomic determinants of nitric oxide biosynthesis in Lactobacillus plantarum: Potential opportunities and reality

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Abstract

As the genomic determinants of nitric oxide (NO) biosynthesis were identified in mammals and microorganisms, it became possible to systematically analyze the genetic conditioning of the process in clinically significant lactobacilli. A computer screening of the genetic determinants of synthetic pathways leading to NO production was performed to verify the NO-synthase origin of NO in Lactobacillus plantarum. Experimental evidence for enzymatic NO generation from L-arginine, rather than nitrite, was obtained by EPR spectroscopy. It was shown with the example of L. plantarum NO synthase that the observed functional activity of proteins is due to a complex transformation of the genetic program into a real catalytic function under certain conditions. © 2007 Pleiades Publishing, Inc.

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Keywords

Computer analysis of homology, Denitrification, EPR, Lactobacilli, Nitric oxide, NO-synthase activity